Aviation Investigation Final Report

Location:	Chitina, Alaska	**Accident Number:**	ANC21FA015
Date & Time:	February 4, 2021, 10:51 Local	**Registration:**	N9725Z
Aircraft:	Cessna 185	**Aircraft Damage:**	Substantial
Defining Event:	Aircraft structural failure	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 135: Air taxi & commuter - Non-scheduled		

Analysis

The pilot was conducting a scheduled passenger flight in the single-engine airplane in day visual meteorological conditions. Recovered data from an onboard GPS unit revealed that, after reaching a GPS altitude of about 7,500 ft, the airplane flew on a southeast track for about 10 minutes with a groundspeed between 120 and 130 knots. About 2 minutes before the accident, the airplane initiated a gradual right turn to the south and began a descent that averaged about 734 ft per minute. The last fully recorded in-flight data point showed the airplane at a GPS altitude of 5,715 ft with a groundspeed of 154 kts.

The distribution of the wreckage at the accident site indicated a high-speed, near vertical impact, with portions of the right wing and empennage scattered between 400 and 700 ft from the main wreckage, consistent with an in-flight breakup. Fractured areas of the right wing, the left deformation of the vertical stabilizer and rudder, and the fractured attach points were consistent with overload separation of the right wing, which caused the airplane to snap roll to the right, creating the necessary torsional forces to deform the vertical stabilizer and twist the empennage from the fuselage. Examinations on the engine and airframe did not reveal evidence of any pre-existing anomalies that would have precluded normal operation. Flight control continuity was established, and the propeller showed evidence of rotation at impact.

All of the fractured surfaces exhibited a dull, grainy appearance consistent with overstress separation. There was no evidence of fatigue or corrosion noted on any of the areas examined. The reason for the overstress and subsequent in-flight breakup could not be determined based on the available information.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

An in-flight breakup during cruise flight for reasons that could not be determined based on available evidence.

Findings

Not determined	(general) - Unknown/Not determined

Factual Information

History of Flight

Enroute-cruise	Aircraft structural failure (Defining event)

On February 4, 2021, about 1051 Alaska standard time, a Cessna A185E, N9725Z, sustained substantial damage when it was involved in an accident about 14 miles northeast of Chitina, Alaska. The commercial pilot and passenger were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 135 scheduled passenger flight.

A Garmin 696 GPSMAP was recovered from the accident site. GPS data logs for the day of the accident revealed that, after reaching a GPS altitude of about 7,500 ft, the airplane continued on a southeasterly track for about 10 minutes with a groundspeed between 120 and 130 knots. About 2 minutes before the accident, the airplane initiated a gradual right turn to the south and began a descent, which averaged about 734 ft per minute. The last fully recorded in-flight data point was at 1050:52, when the airplane was at a GPS altitude of 5,715 ft with a groundspeed of 154 kts and on a track of 282° (see figure 1).

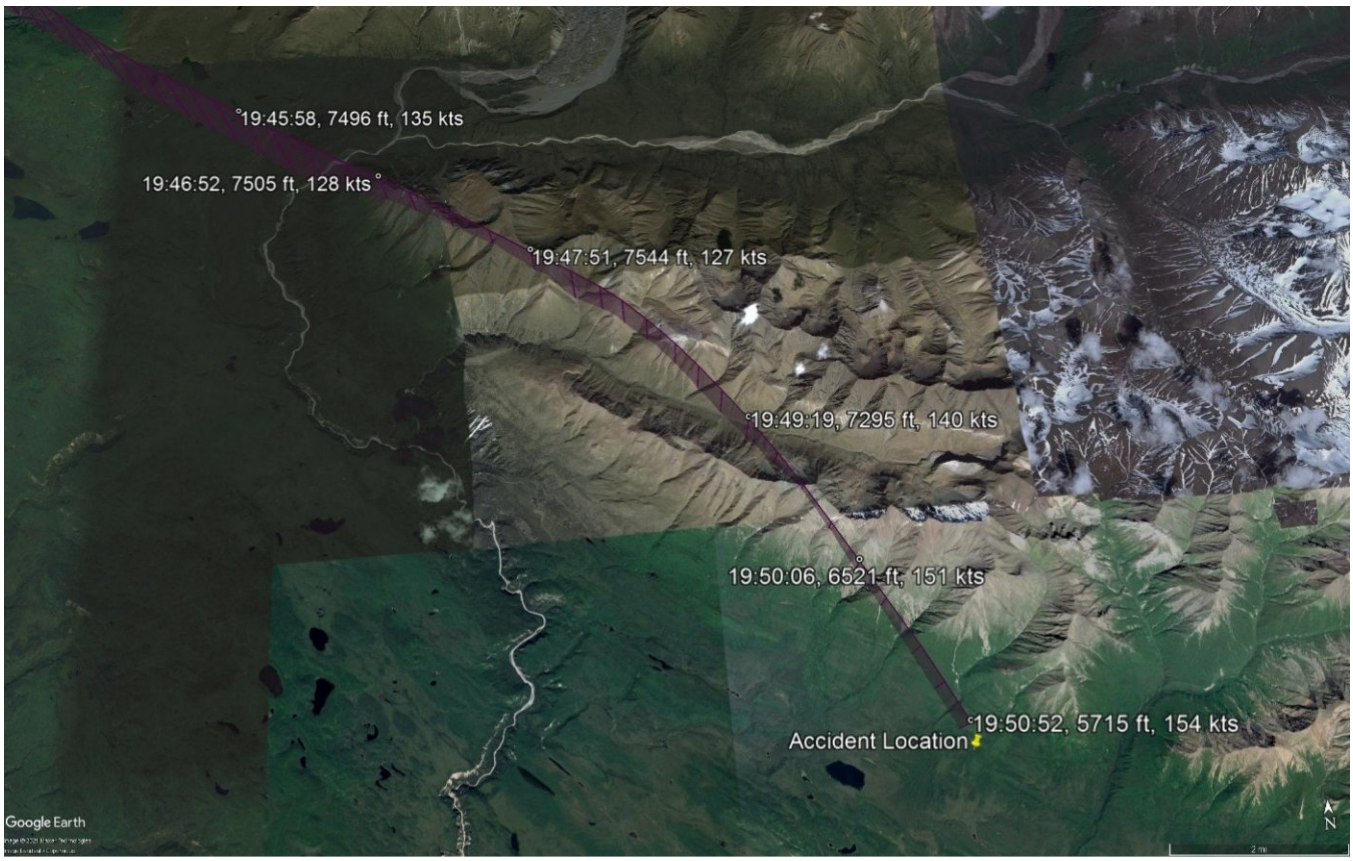

Figure 1. Flight track

Pilot Information

Certificate:	Commercial	**Age:**	46,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine; Instrument airplane	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	February 22, 2019
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	June 22, 2020
Flight Time:	2883 hours (Pilot In Command, all aircraft), 62 hours (Last 90 days, all aircraft), 19 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N9725Z
Model/Series:	185 E	**Aircraft Category:**	Airplane
Year of Manufacture:	1966	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	185-1035
Landing Gear Type:	Tailwheel; Ski/wheel	**Seats:**	2
Date/Type of Last Inspection:	November 6, 2020 100 hour	**Certified Max Gross Wt.:**	3300 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	6569.75 Hrs as of last inspection	**Engine Manufacturer:**	Continental
ELT:	C126 installed, activated, aided in locating accident	**Engine Model/Series:**	IO-520-D
Registered Owner:	On file	**Rated Power:**	300 Horsepower
Operator:	Copper Valley Air Service	**Operating Certificate(s) Held:**	Commuter air carrier (135), On-demand air taxi (135)

The accident airplane was involved in a collision in May 2014 that damaged the right wing, vertical stabilizer, rudder, right horizontal stabilizer, and right elevator. The right wing was replaced with a wing from a Cessna 180H. The differences between the Cessna 180H wing and the Cessna A185E wing are not structurally significant. Some repairs were performed to the

outboard upper skin and ribs of the replacement right wing. The vertical stabilizer, rudder, right horizontal stabilizer, and right elevator were repaired.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	PAGK,1562 ft msl	**Distance from Accident Site:**	53 Nautical Miles
Observation Time:	12:53 Local	**Direction from Accident Site:**	311°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.26 inches Hg	**Temperature/Dew Point:**	-22°C / -26°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Glennallen, AK (PAGK)	**Type of Flight Plan Filed:**	Company VFR
Destination:	McCarthy, AK (PMXY)	**Type of Clearance:**	None
Departure Time:	10:21 Local	**Type of Airspace:**	Class E

Two pilots that responded to the accident site shortly after the accident reported no turbulence or significant winds aloft from the surface to 5,500 ft msl.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	61.584722,-144.04583

The wreckage was scattered over mountainous, wooded terrain northeast of Chitina on the north side of the Chitina River Valley. The main wreckage included both landing gear with wheel penetration skis, engine, firewall, main fuselage, instrument panel, and left wing. The right wing, right aileron, right lift strut, and empennage were not found with the main

wreckage. The part (top skin of right wing) located farthest from the main wreckage was about 710 ft from the main wreckage; the empennage was located about 446 ft from the main wreckage; and the inboard portion of the right wing was located about 407 ft from the main wreckage. The debris path and separated sections of the right wing and empennage were consistent with an in-flight breakup (see figure 2).

Figure 2. Debris field

Examination of the main wreckage revealed evidence consistent with the airplane impacting the ground in a high-speed, near-vertical descent. The lower end of the left-wing strut was separated from the fuselage. The left-wing strut bolt was intact in the fitting and the fuselage lugs were fractured through the hole. The left wing remained attached at the fuselage attach points and exhibited compressive buckling on the inboard portion of the wing consistent with impact damage and the left wing being fully attached and intact before ground impact.

The skis remained attached to their respective attach points and all ski arresting cables, bungees, and rigging were intact and attached at their respective attach points. No preimpact mechanical anomalies were noted with the skis or their rigging.

All airframe parts were located within the main wreckage and surrounding woods. Flight control continuity was confirmed to all flight control surfaces except where recovery and overload separations existed. Both right-wing attach points exhibited damage and deformation in an upward direction at the wing root, consistent with a positive overload separation of the right wing before ground impact. The right-wing strut separated from the lower strut fitting with the rivets showing shear overstress signatures consistent with positive overload. The left deformation of the vertical stabilizer and rudder and the fractured attach points were

consistent with the right wing failing first. Cable tears in the left fuselage and right empennage were consistent with the tail departing to the left side. All of the fracture surfaces examined had a dull, grainy appearance consistent with overstress separation. There was no evidence of corrosion or fatigue noted on any of the areas examined.

The two-bladed, constant speed propeller remained attached to the crankshaft flange; however, the crankshaft was fractured behind the crankshaft flange near the front of the engine case. The fractured surface had an angular, dull, grainy appearance consistent with overstress separation. One of the propeller blades was slightly bent aft and rotated freely in the hub. The other propeller blade was bent aft about 180° with minor leading-edge chunking, chordwise scratching, and gouging on the cambered face.

Examination of the engine did not reveal evidence of any preimpact anomalies that would have precluded normal operation.

Administrative Information

Investigator In Charge (IIC):	Banning, David
Additional Participating Persons:	George O'Connor; Federal Aviation Administration ; Anchorage , AK Martin Boniek; Copper Valley Air Service; Glennallen, AK Phillip Knapp; Copper Valley Air Service; Anchorage , AK David Swartz; Federal Aviation Administration ; Anchorage , AK Henry Soderlund; Cessna / Textron Aircraft ; Wichita, AK
Original Publish Date:	July 19, 2022
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=102605

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